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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/533,473

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Carlos F. Fuente

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EXAMINER

LOONAN, ERIC T

ART UNIT

PAPER NUMBER

2189

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/533,473

Applicant(s)

FUENTE ET AL.

Examiner

ERIC LOONAN

Art Unit

2189

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 June 2008.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 7 and 13 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 7 and 13 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 29 April 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-8508)
Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

This Office Action is the response to applicant's remarks submitted 24 June 2008 based on application 10/533,473 originally filed 29 April 2005. **Claims 7 and 13** remain pending and have been considered below.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. **Claims 7 and 13** are rejected under 35 U.S.C. 102(b) as being anticipated by Ohran (US Patent 5,835,953).
3. **Claim 7:** Ohran teaches a method for performing lock management for a flash copy in a shared storage system, said method comprising: designating only one node within said shared storage system an owner node for metadata relating to all input/output (I/O) relationships of a region of storage (Fig 1, 12 – Primary System); designating remaining nodes within said shared storage system client nodes (Fig 1, 14 – Backup System); in response to a host I/O request arriving at one of said client nodes (Fig 5, 94 where the backup system initiates the backup), suspending said host I/O request by said one client node and inquiring said owner node if said region of storage associated with said host I/O request has been copied (Fig 5, 100); placing a lock record by said owner node against an appropriate metadata for said region of storage associated with said I/O request if said region of storage associated with said host I/O

request has not been copied (Fig 5, 102); if said host I/O request is a Target Read (Fig 6, 112 – Backup Read Request), transferring data to a host by said one client node via a Flash Copy algorithm, and sending an UNL message to said owner node by said one client node at the completion of said data transfer; if said I/O request is a Target Write or Source Write (Fig 10, 214 or 216), performing a copy-on-write by said one client node, and sending an UNLC request to said owner node by said one client node at the completion of said copy-on-write (Fig 10, 224); upon the receipt of said UNLC request, marking by said owner node in its metadata a region affected; removing said lock record; informing any waiting requests that said region has been copied and issuing an UNLD message to said one client node; upon the receipt of said UNLD message, releasing said suspended write operation by said one client node and completing said write operation to said host (Fig 10, 230); and removing said lock record by said owner node from its metadata table upon the receipt of said UNL message (Fig 6, 118 and 120).

4. **Claim 13:** Ohran teaches a computer storage medium having a computer program product for performing lock management for a flash copy in a shared storage system, said computer storage medium comprising: computer program code for designating only one node within said shared storage system an owner node for metadata relating to all input/output (I/O) relationships of a region of storage (Fig 1, 12 – Primary System); computer program code for designating remaining nodes within said shared storage system client nodes (Fig 1, 14 – Backup System); computer program code for, in response to a host I/O request arriving at one of said client nodes (Fig 5, 94

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where the backup system initiates the backup); suspending said host I/O request by said one client node and inquiring said owner node if said region of storage associated with said host I/O request has been copied (Fig 5, 100); computer program code for placing a lock record by said owner node against an appropriate metadata for said region of storage associated with said host I/O request if said region of storage associated with said host I/O request has not been copied (Fig 5, 102); computer program code for, if said host I/O request is a Target Read (Fig 6, 112 – Backup Read Request), transferring data to a host by said one client node via a Flash Copy algorithm, and sending an UNL message to said owner node by said one client node at the completion of said data transfer; computer program code for, if said I/O request is a Target Write or Source Write (Fig 10, 214 or 216), performing a copy-on-write by said one client node, and sending an UNLC request to said owner node by said one client node at the completion of said copy-on-write (Fig 10, 224); computer program code for, upon the receipt of said UNLC request, marking by said owner node in its metadata a region affected; removing said lock record; informing any waiting requests that said region has been copied and issuing an UNLD message to said one client node; computer code for, upon the receipt of said UNLD message, releasing said suspended write operation by said one client node and completing said write operation to said host (Fig 10, 230); and computer program code for removing said lock record by said owner node from its metadata table upon the receipt of said UNL message (Fig 6, 118 and 120).

Response to Arguments

Applicant's response filed 24 June 2008 based on Office Action mailed on 29 May 2008 has been fully considered below.

Claim Rejections under 35 U.S.C. 102(b)

5. Applicant argues that the prior art of record fails to teach Claim 7 and 13's limitation of "designating only one node within a shared storage system an owner node for metadata relating to all input/output (I/O) relationships of a region of storage" and "designating remaining nodes within said shared storage system client nodes". The applicant notes that in a previous Office Action, the examiner asserts that the claimed owner node limitation is characterized by primary system 12 of Ohran, and the examiner points out that "the primary system [of Ohran] is further described as being 'one or more' systems. The applicant asserts "If that is the position the Examiner takes, then the Examiner's characterization is definitely contrary to the claimed step of "designating only one node within a shared storage system an owner node ...".

The examiner has considered applicant's remarks; however, the examiner is not persuaded by them and retains the rejection. Ohran's system does not necessitate more than one primary system; therefore, Ohran's system with one primary system reads upon applicant's claimed limitation.

6. Applicant argues that the prior art of record fails to teach Claim 7 and 13's limitation of "in response to a host I/O request arriving at one of said client nodes, suspending said host I/O request by said one client node and inquiring said owner node if said region of storage associated with said host I/O request has been copied". The

applicant maintains that "Since block 94 is not a condition precedent for block 100, thus, block 100 was not performed in response to decision block 94". The applicant further argues that "the claimed suspending step specifically calls for suspending a host I/O request from the condition precedent (i.e., in response to a host I/O request arriving at one of said client nodes), which is also the step that is not disclosed by Ohran."

The examiner has considered applicant's remarks, but is not persuaded by them and retains the rejection of record. The examiner again directs applicant to Column 20, Lines 50-65 of Ohran, specifically, "if decision block 94 detects that a backup has been initiated by the backup system, then execution proceeds to step 100" (Lines 53-55).

7. Applicant argues that the prior art of record fails to teach Claim 7 and 13's limitation of "placing a lock record by said owner node against an appropriate metadata for said region of storage associated with said host I/O request if said region of storage associated with said host I/O request has not been copied." The applicant argues against examiner's interpretation of a lock by stating that "If Ohran's snapshot can be interpreted as the claimed locking, then Ohran must have a step for removing the snapshot."

The examiner has considered applicant's remarks, but is not persuaded by them and retains the rejection of record. The examiner directs the applicant to Ohran "Fig 4, step 72 clears the snapshot map and step 74 clears the snapshot storage." (Column 23, Lines 62-63).

8. Applicant argues that the prior art of record fails to teach Claim 7 and 13's limitation of "if said host I/O request is a Target Read, transferring data to a host by said

one client ..." and notes that the claimed host I/O request in the claimed transferring step is the same host I/O request from the above-mentioned suspending step.

The examiner has considered applicant's remarks, but is not persuaded by them. Column 21, Lines 62-67 and Column 22, Lines 1-3 of Ohran discuss how Fig 6 is incorporated into the system as a separate processing block.

9. Applicant argues that the prior art of record fails to teach Claim 7 and 13's limitations "if said I/O request is a Target Write or Source Write, performing a copy-on-write by said one client node, and sending an UNLC request to said owner node by said one client node at the completion of said copy-on-write" and "upon the receipt of said UNLD message, releasing said suspended write operation by said one client node and completing said write operation to said host" as simply not being disclosed by Ohran. The examiner respectfully disagrees and provides references for Ohran's teachings in the claim rejection.

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ERIC LOONAN whose telephone number is (571)272-6994. The examiner can normally be reached on Monday-Friday, 7:30am-5:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Reginald Bragdon can be reached on (571) 272-4204. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Eric Loonan/
Examiner, Art Unit 2189

/Reginald G. Bragdon/
Supervisory Patent Examiner, Art Unit 2189